

Application No. 10/674095
Amndt. Dated 07/07/04
Reply to Office Action of 06/09/2004

Amendments to the Claims:

Claims 1- 10 (canceled)

11. (previously presented) An apparatus for handling a pair of sheet metal workpieces to be welded, comprising:

a first workpiece holder;

a second workpiece holder;

wherein the first and second workpiece holders are positioned so that an edge of one of the pair of sheet metal workpieces is in contact with, or separated by a gap from, an edge of the other sheet metal workpieces;

a backing element disposed on a first side of the sheet metal workpieces; and

a squeeze roller, disposed on a second side of the sheet metal workpieces opposite the first side and substantially aligned with the backing element, wherein the squeeze roller is formed as a body symmetrical in rotation, and wherein force selectively applied to the squeeze roller will cause plastic deformation of one of the pair of sheet metal workpieces and thereby cause the deformed sheet metal workpiece to extend into the gap.

Claims 12 - 22 (canceled)

23. (previously presented) The apparatus of claim 11, further comprising a workpiece brake that can be selectively actuated into contact with one of the sheet metal workpieces and thereby cause the contacted sheet metal workpiece to be clamped between the backing element and the workpiece brake.

24. (previously presented) The apparatus of claim 23, wherein the workpiece brake is disposed at an acute angle relative to the contacted sheet metal workpiece.

Claims 25 - 26 (canceled)

27. (previously presented) An apparatus for handling a pair of sheet metal workpieces to be welded, comprising:

a first workpiece holder;

a second workpiece holder;

wherein the first and second workpiece holders are positioned so that an edge of one of the pair of sheet metal workpieces is in contact with, or separated by a gap from, an edge of the other sheet metal workpieces; and

means for plastically deforming one of the sheet metal workpieces, wherein said means for plastically deforming one of the sheet metal workpieces can be selectively applied to cause that sheet metal workpiece to extend into the gap.

28. (previously presented) The apparatus of claim 27, wherein the means for plastically deforming one of the sheet metal workpieces comprises:

a backing element disposed on a first side of the sheet metal workpieces; and

a squeeze roller, disposed on a second side of the sheet metal workpieces opposite the first side and substantially aligned with the backing element, wherein the squeeze roller is formed as a body symmetrical in rotation, and wherein force selectively applied to the squeeze roller will cause plastic deformation of one of the pair of sheet metal workpieces and thereby cause the deformed sheet metal workpiece to extend into the gap.

Claim 29 (canceled)

30. (previously presented) The apparatus of claim 28, further comprising a workpiece brake that can be selectively actuated into contact with one of the sheet metal workpieces and thereby cause the contacted sheet metal workpiece to be clamped between the backing element and the workpiece brake.

Claims 31 - 32 (canceled)

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33. (previously presented) An apparatus for handling a pair of sheet metal workpieces to be welded, comprising:

a first workpiece holder;
a second workpiece holder;
wherein the first and second workpiece holders are positioned so that an edge of one of the pair of sheet metal workpieces is in contact with, or separated by a gap from, an edge of the other sheet metal workpieces;
a pair of backing elements disposed on a first side of the sheet metal workpieces; and
a pair of squeeze rollers, disposed on a second side of the sheet metal workpieces opposite the first side and substantially aligned with the backing elements, wherein the squeeze rollers are formed as a body symmetrical in rotation, and wherein force selectively applied to the squeeze rollers will cause plastic deformation in the pair of sheet metal workpieces and thereby cause the sheet metal workpieces to extend into the gap.

Claims 34 - 35 (canceled)

36. (previously presented) The apparatus of claim 11, wherein the squeeze roller is mounted on a support to permit rotation of the squeeze roller in any direction.

37. (previously presented) A method for welding a pair of sheet metal workpieces with a butt joint, comprising the steps of:

positioning the first and second workpieces so that an edge of one of the pair of sheet metal workpieces is substantially in contact with an edge of the other of the pair of sheet metal workpieces;

plastically deforming at least one of the workpieces with a squeeze roller before or in a welding zone to reduce a width of any gap present between the first and

second workpieces;

guiding the squeeze roller along a joint of any desired curve form in a manner such that the plastic deformation produced is substantially dependent on the force acting on the squeeze roller and is substantially independent of the line of the joint; and

welding the workpieces together at the joint with a laser.

38. (previously presented) The method of according to claim 37, wherein the at least one workpiece is plastically deformed in a region of the workpiece immediately adjacent to the edge of the workpiece.

Claim 39 (canceled)

40. (previously presented) A method for handling a pair of sheet metal workpieces to be welded, comprising the steps of:

positioning the first and second workpieces so that an edge of one of the pair of sheet metal workpieces is substantially in contact with an edge of the other of the pair of sheet metal workpieces;

plastically deforming at least one of the workpieces with a squeeze roller along the edge that is substantially in contact with the other workpiece to reduce a width of any gap present between the first and second workpieces, wherein the plastic deformation occurs before or in a welding zone; and

guiding the squeeze roller along the edge in a manner such that the plastic deformation produced is substantially dependent on the force acting on the squeeze roller and is substantially independent of the line of the joint.

Claims 41 - 42 (canceled)